

**IN THE CLAIMS:**

Please CANCEL claims 1, 2 and 6-30, without prejudice or disclaimer.

Please AMEND the claims and ADD new claims as indicated below:

1. (CANCELED)
2. (CANCELED)
3. (CURRENTLY AMENDED) An information reading apparatus ~~characterized by~~ comprising:
  - a signal acquiring unit for acquiring from a medium, a signal containing binary digit information having a predetermined information length and an arrangement;
  - an elemental frequency extracting unit for extracting an elemental frequency corresponding to an elemental unit length of the binary digit information of the information length from the acquired signal;
  - a band limiting unit for limiting a frequency band of the acquired signal based on the extracted elemental frequency information;
  - a timing point extracting unit for extracting a timing point which is in synchronism with the acquired signal and has the elemental frequency, based on the acquired signal and the elemental frequency information;
  - an amplitude extracting unit for extracting an amplitude value of a signal from the band limiting unit in accordance with the timing point extracted by the timing point extracting unit;
  - a tri-state value generating unit for generating tri-state value data from the amplitude ~~values-value~~ extracted by the amplitude extracting unit in accordance with the timing point; and
  - a reading unit for reading a ratio of the binary digit information to the information length by calculating the tri-state value data generated by the tri-state value generating unit.
4. (CURRENTLY AMENDED) An information reading apparatus according to Claim 3, ~~characterized in that~~wherein the signal acquiring unit comprises a photoelectric converting unit for receiving a ray of incident light and converting the received ray of light into an electric signal based on ~~the a~~ photoelectric conversion, a determining unit for determining whether the electric signal supplied from the photoelectric~~photo-electric~~ converting unit derives from ~~photo-~~

~~electric~~photoelectric conversion effected on the ray of light reflected on the medium or not, and a gate unit arranged to respond to ~~the a~~ result of determination of the determining unit in such a manner that if it is determined that ~~the a~~ signal component derives from photoelectric conversion effected on the reflected ray of light then the signal component is acquired as the acquired signal while if it is determined that the signal component derives from photoelectric conversion effected on any ray of light other than the reflected ray of light then the signal component is excluded from an object of a signal to be acquired.

5. (CURRENTLY AMENDED) An information reading apparatus according to Claim 4, ~~wherein characterized by an arrangement such that~~ the determining unit is supplied with a signal deriving from conversion from an analog signal status to a digital signal status effected on the electric signal from the photoelectric converting unit, and the determining unit determines whether the signal derives from photoelectric conversion effected on the ray of light reflected on the medium or not.

6. (CANCELED)
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- 28. (CANCELED)
- 29. (CANCELED)
- 30. (CANCELED)

31. (NEW) An information reading apparatus comprising:

- means for acquiring from a medium, a signal containing binary digit information having a predetermined information length and an arrangement;
- means for extracting an elemental frequency corresponding to an elemental unit length of the binary digit information of the information length from the acquired signal;
- means for limiting a frequency band of the acquired signal based on the extracted elemental frequency information;
- means for extracting a timing point which is in synchronism with the acquired signal and has the elemental frequency, based on the acquired signal and the elemental frequency information;
- mean for extracting an amplitude value of a signal from said means for limiting in accordance with the timing point extracted by said means for extracting a timing point;
- means for generating tri-state value data from the amplitude values extracted by said means for extracting an amplitude value; and
- means for reading a ratio of the binary digit information to the information length by calculating the tri-state value data generated by said means for generating tri-state value data.

32. (NEW) An information reading apparatus according to Claim 31, wherein said means for acquiring comprises

- means for receiving a ray of incident light and for converting the received ray of light into an electric signal based on a photoelectric conversion,
- means for determining whether the electric signal derives from photoelectric conversion effected on the ray of light reflected on the medium or not, and
- a gate unit arranged to respond to a result of said means for determining in such a

manner that if it is determined that the electric signal derives from photoelectric conversion effected on the reflected ray of light then the electric signal is acquired as the acquired signal while if it is determined that the electric signal derives from photoelectric conversion effected on any ray of light other than the reflected ray of light then the electric component is excluded from an object of a signal to be acquired.

33. (NEW) An information reading apparatus according to Claim 32, wherein the means for determining is supplied with a signal deriving from conversion from an analog signal status to a digital signal status effected on the electric signal from the means for receiving and for converting, and the means for determining determines whether the signal derives from photoelectric conversion effected on the ray of light reflected on the medium or not.

34. (NEW) An apparatus comprising:

- a signal acquiring unit acquiring, from a medium, a signal containing binary digit information having a predetermined information length and an arrangement;
- an elemental frequency extracting unit extracting an elemental frequency corresponding to an elemental unit length of the binary digit information of the information length from the acquired signal;
- a band limiting unit limiting a frequency band of the acquired signal based on the extracted elemental frequency information;
- a timing point extracting unit extracting a timing point which is in synchronism with the acquired signal and has the elemental frequency, based on the acquired signal and the elemental frequency information;
- an amplitude extracting unit extracting an amplitude value the frequency band limited, acquired signal in accordance with the extracted timing point;
- a tri-state value generating unit generating tri-state value data from the extracted amplitude value in accordance with the extracted timing point; and
- a reading unit reading a ratio of the binary digit information to the information length by calculating the generated tri-state value data.

35. (NEW) A method comprising:

- acquiring, from a medium, a signal containing binary digit information having a predetermined information length and an arrangement;

extracting an elemental frequency corresponding to an elemental unit length of the binary digit information of the information length from the acquired signal;

limiting a frequency band of the acquired signal based on the extracted elemental frequency information;

extracting a timing point which is in synchronism with the acquired signal and has the elemental frequency, based on the acquired signal and the elemental frequency information;

extracting an amplitude value the frequency band limited, acquired signal in accordance with the extracted timing point;

generating tri-state value data from the extracted amplitude value in accordance with the extracted timing point; and

reading a ratio of the binary digit information to the information length by calculating the generated tri-state value data.

36. (NEW) An apparatus comprising:

means for acquiring, from a medium, a signal containing binary digit information having a predetermined information length and an arrangement;

means for extracting an elemental frequency corresponding to an elemental unit length of the binary digit information of the information length from the acquired signal;

means for limiting a frequency band of the acquired signal based on the extracted elemental frequency information;

means for extracting a timing point which is in synchronism with the acquired signal and has the elemental frequency, based on the acquired signal and the elemental frequency information;

means for extracting an amplitude value the frequency band limited, acquired signal in accordance with the extracted timing point;

means for generating tri-state value data from the extracted amplitude value in accordance with the extracted timing point; and

means for reading a ratio of the binary digit information to the information length by calculating the generated tri-state value data.